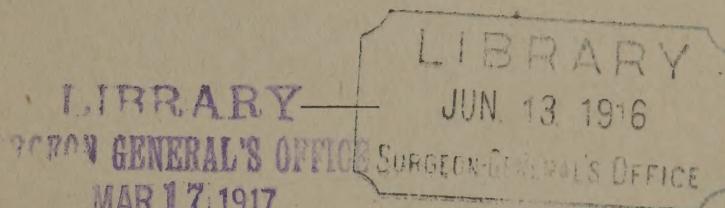


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4,880 Necropsies at Bellevue Hospital



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Medical College; Pathologist to the Third Division, Bellevue  
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## ANATOMIC LESIONS IN LATE ACQUIRED SYPHILIS

A STUDY OF 314 CASES BASED ON THE ANALYSIS OF 4,880  
NECROPSIES AT BELLEVUE HOSPITAL \*

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NEW YORK

There is an aphorism to the effect that to know syphilis is to know medicine, and the physician is adjured, when in doubt, to suspect syphilis, since the extension of the disease is colossal. For example, the Wassermann reaction in Bellevue Hospital has yielded strongly positive results in over 25 per cent. of the enormous number of serums examined. This, of course, does not imply that one in every four persons is syphilitic, although in many instances, the reaction was carried out as a routine measure and not necessarily because contamination was suspected. The figure quoted indicates, nevertheless, that syphilis is even more widely distributed than is generally believed, assuming, of course, that the Wassermann reaction, as carried out with the cholesterol antigen, does not justify the skepticism with which it is received in certain quarters. On the other hand, among 4,880 necropsies performed at Bellevue Hospital in the past ten years, anatomic confirmation of the existence of syphilis was found in only 314 cases, or in 6.5 per cent.

Any factor which serves to establish the existence of syphilis in the individual assumes importance to the community. Until recent years, the diagnosis of late syphilis depended on the willingness of the patient to admit contagion, or on the ability of the physician to recognize its obscure and often almost illegible legacies. As a result of the introduction of laboratory methods,

\* From the Department of Pathology of Bellevue and Allied Hospitals.

not only has the avowal of the patient become a matter of frequently negligible consideration, but it is to be feared that these methods have been adopted at the expense of those signs, the recognition of which involves an intimate knowledge of the pathology of the disease.

During the past ten years I have had numerous occasions before or during the performance of necropsies to inquire of the attending physician or of the intern as to the existence of syphilis in the body under investigation. Formerly the reply almost invariably referred to the patient's denial or admission of infection—a notoriously unreliable guide, in which the contributing sources of error are not confined to the disposition of the average individual to falsify venereal history. Since the advent of the Wassermann test the answer has equally often involved the status of the patient in relation to that reaction. Seldom, however, has it been possible in my experience to elicit adequate information referable to physical changes in the later stages of acquired syphilis, sometimes in spite of the presence of definite and detectable lesions in the skin, visible mucous membranes, bony system, etc. There are circumstances in which such changes may have to be depended on entirely to determine the diagnosis of syphilis, as, for example, in those instances in which the patient's serum is not suitable for the Wassermann reaction and reactivation is impracticable, or in those numerous and highly regrettable cases in which the technic is faulty and the result misleading.

Experience of the sort indicated has prompted me to analyze the protocols of nearly 5,000 subjects coming to necropsy in Bellevue Hospital, with the object of determining the incidence, nature and distribution of the anatomic changes in acquired syphilis.

#### THE SKIN AND MUCOCUTANEOUS JUNCTIONS

The vast majority of all syphilitic subjects present cutaneous lesions in the secondary stage, but the eruption is frequently of such a nature that its complete disappearance is favored by evolution or by the influence of treatment. By far the larger numbers of syphilitic rashes are characterized by dilatation of the cutaneous vessels and by the transudation of small quantities of blood serum, and moderate infiltration of

plasma cells. There is little, if any, tendency to sclerosis of connective tissue. Nevertheless, there are circumstances in which the secondary syphilitid, with or without previous pustulation, undergoes cicatrization attended by atrophy of the surface epithelium, or by increase in the number or in the pigment of the chromatophores, producing scars which are pale, or present a pigmented periphery. The late stages of syphilis, on the contrary, are not uncommonly accompanied by ulcerative skin lesions, the healing of which produces extensive scarring.

In the Bellevue Hospital series of 314 cases of late acquired syphilis, lesions of the skin and mucocutaneous junctions were encountered 106 times, or in 33.4 per cent. Pretibial scars were present in forty-six cases. Of these, thirty-one were bilateral; eight were on the right shin and seven on the left. The scars were copper colored in four cases, pale and atrophic in twenty-two, and atrophic and pigmented in nineteen. Atrophic or pigmented scars were present in a more general distribution in sixteen instances. Thus, cutaneous scars, representing a legacy from the secondary rash, were present in 58.5 per cent. of the total number of mucocutaneous changes.

Other lesions of the skin and mucocutaneous junctions occurred in forty-four cases, as follows: rupia 17, vitiligo syphilitica 2, one of them being associated with symmetrical thickening and brownish discoloration of the hands — pellagroid syphilitid; coppery rash of the face 3, papulosquamous syphilitid of general distribution 2, papular syphilitid of hands and forearm 1, anal condylomas 2, penile scars 17.

In short, the figure quoted indicates that late acquired syphilis is accompanied by residua of the secondary rash, or by other changes in the skin, in such a percentage of cases as to represent a diagnostic feature of great importance. Cutaneous lesions of the type indicated are frequently overlooked or misinterpreted, a statement which I venture on the basis of experiences at the necropsy table, where old syphilitic changes in the skin are not uncommonly pointed out for the first time.

#### THE LYMPHOID SYSTEM

Lymphoid hyperplasia is essentially an early manifestation of secondary syphilis and is marked by sim-

ple numerical increase in the lymphoid cells and in the cells of the sinuses. Enlargement of the superficial lymph nodes is but an expression of the general infection of syphilis, and bears no constant relationship to the severity of the disease. It is not infrequently marked in apparently mild syphilis, and of negligible intensity in syphilis with extensive clinical manifestations.

Hyperplasia of the lymphoid cells is by no means confined to the superficial nodes, but is shared by other lymphoid foci, notably the lingual tonsils and the spleen. Thus, in thirty subjects presenting typical manifestations of active secondary syphilis, 70 per cent. showed extensive hyperplasia of the lymphoid follicles at the base of the tongue (Symmers). In the same way, it is occasionally observed that the spleen is enlarged in secondary syphilis, and participation of the lymphoid follicles is not to be denied as a contributing factor.

Lymphoid hyperplasia in syphilis, however, is an ephemeral process, and unless it is succeeded by interstitial fibrosis, tends to disappear without any detectable residuum. It is not surprising to learn, therefore, that of the 314 cases of late acquired syphilis in the Bellevue Hospital series, only twenty, or 6 per cent., revealed hyperplastic changes in the lymph nodes. Of this number adenopathy was general in four, in two the axillary nodes were alone involved, in five cases the cervical and axillary nodes were enlarged in association with the inguinal, and in nine instances the inguinal nodes were alone involved. The significance of the latter fact is partially vitiated by the knowledge that inguinal adenopathy is common in healthy individuals.

#### THE OSSEOUS SYSTEM

Syphilitic lesions of the osseous system are too well known to merit discussion here beyond the statement that, in the Bellevue Hospital series, they were encountered forty-eight times, or in 14.9 per cent., and were distributed as follows: necrosis of the nasal bones 3, perforation of the nasal septum 1, perforation of the hard palate 1, chronic productive inflammatory lesions of the cranial bones 23. Of the latter, the frontal bone or its periosteum was alone involved 9 times, the parietal 3, the frontal and temporal 2, the frontal and parietal 1, the occipital and frontal 1, the temporal 1,

the sphenoid 1, and, in 5 cases, the calvarium as a whole was involved.

Chronic productive periostitis of the tibia occurred sixteen times, or in 34 per cent. of the total number of the osseous lesions.

Syphilitic changes were encountered in the metatarsal bones, the radius, humerus and first rib once each.

#### THE TESTICLE

There is a syphilitic lesion of the testicle characterized by slowly progressive hyperplastic changes in the connective tissue eventuating in complete or partial sclerosis of the organ, the so-called chronic interstitial orchitis. Among 171 male subjects of late acquired syphilis in the Bellevue Hospital series, chronic interstitial orchitis was found sixty-seven times, or in 39 per cent. Both testicles were involved forty times (23 per cent.), the left testicle was alone involved in eighteen (10.5 per cent.), and the right testicle in nine (5 per cent.).

In view of the fact that, in advanced cases, the testicle is greatly diminished in size and its consistence correspondingly increased, the lesion in question furnishes a sign of value in the clinical and anatomic diagnosis of syphilis.

In connection with the general subject of testicular syphilis, it is worthy of emphasis that in not one of the 314 cases of fatal acquired syphilis did we encounter gumma of the testicle proper. In one case a gumma was found in the epididymis, a reversal of the order usually quoted, since the epididymis, while frequently the point of commencement of testicular tuberculosis, is represented as enjoying relative immunity from syphilis. Nevertheless, textbooks frequently refer to gummas of the testicle as lesions of common occurrence, and not only susceptible of diagnosis and treatment, but of value as confirmatory of syphilis in other parts. This view, I believe, is exaggerated, and is the expression of an ancient error, the preservation of which is traceable to the fact that makers of textbooks too commonly adopt statements contained in earlier works. I do not recall having seen a gumma of the testicle in several thousand necropsies, and have but once encountered the lesion in specimens removed surgically. Dr. Charles Norris, although

possessing great experience in pathologic work, tells me that he has seldom seen testicular gummas.

#### INDURATIVE ATROPHY OF THE BASE OF THE TONGUE

Pathologists have long recognized a syphilitic lesion of the base of the tongue characterized by obliteration of the normal surface markings and by smoothness and induration of the tissues in that vicinity, the so-called smooth or indurative atrophy of Virchow. The lesion is by no means rare, and is one of the most characteristic and valuable, and one of the most despised signs of late acquired syphilis. I have rarely encountered a clinician who was familiar with the lesion and who included it among the objective methods of determining the existence of syphilis. In the postmortem room, on the contrary, we are almost daily able to point out the change and to connect it with indubitable signs of syphilis in other parts.

In normal circumstances the base of the tongue presents, on either side of the median raphe, between the circumvallate papillae in front and the epiglottis behind, a dozen or more small, oval or rounded, nodular elevations representing lymphoid follicles. They frequently participate in the lymphoid hyperplasia of secondary syphilis, and as the disease progresses, tend to disappear and to be replaced by fibrous tissue, the base of the tongue becoming pale, flattened and indurated.

On the other hand, one often encounters simple smoothness and flattening of the base of the tongue in elderly or cachectic subjects in whom there is no reason to suspect syphilis, but in these individuals the essential feature of Virchow's smooth atrophy is lacking, namely, induration due to connective tissue replacement. Therefore, in approaching the diagnosis, both from the clinical and anatomic point of view, the finger should be trained to appreciate the degree of resistance offered by the base of the tongue, and the sense of sight used only as an adjunct to that of touch.

The incidence of indurative atrophy of the base of the tongue has not been definitely determined. For example, among 623 necropsies performed at the New York Hospital by Dr. Elser and myself, acquired syphilis was determined in seventy-five instances, and of this number sixty-four, or 85 per cent., presented

the classical signs of indurative atrophy of the base of the tongue. On the other hand, among 4,880 necropsies performed by various individuals at Bellevue Hospital, the lesion was recognized in only 25 per cent. of 314 cases of late acquired syphilis. It so happens, however, that, in the New York Hospital necropsies, both Dr. Elser and myself were specifically interested in the investigation of syphilis of the tongue, and seldom, if ever, missed an opportunity to remove the organs of the mouth and throat in the routine performance of necropsies. At Bellevue Hospital, however, intramural conditions are such that postmortem investigation of the tongue is frequently denied, a fact which, taken in connection with the personal interest and experience of the pathologist, tends to explain the discrepancy. Lewin and Heller, in an analysis of 6,583 necropsies, found anatomic signs of syphilis in 200 subjects (3.4 per cent.), and, of these, indurative atrophy of the tongue was present in 71, or 35 per cent.

#### THE RESPIRATORY TRACT

In Conner's analysis of 128 cases of syphilis of the trachea and bronchi, gummas occurred in 15 per cent., ulcerative lesions in 39 per cent., endotracheal or bronchial scarring in 36 per cent., and fibrous peritracheitis in 6 per cent. In the ulcerative lesions, perforation of the tracheal or bronchial wall occurred in twelve instances, five of which were attended by erosion of blood vessels and fatal hemorrhage; in two cases the esophagus was perforated, and in three instances erosion of the tracheal wall resulted in intrathoracic abscess formation. In several of the cases, fragments of cartilage were coughed up from time to time. In thirteen of forty-seven cases of endotracheal fibrosis, the lumen of the tube was encroached on to such an extent as to occasion marked signs of irritation or suffocative attacks ending fatally. In eight cases of peritracheal fibrosis, one or both recurrent laryngeal nerves were involved in four instances.

In the Bellevue Hospital series of 314 cases of late syphilis, lesions of the respiratory tract occurred thirty-five times, or in 10.5 per cent. The larynx was involved in twelve, or 38 per cent. of the total number of lesions of the respiratory tract. Of the twelve cases of laryngeal syphilis, cicatricial lesions occurred five times, ulcerative lesions five times, gummas once, and

leukoplakia of the pyriform fossae and epiglottis, once. The figure quoted does not take cognizance of that considerable number of cases (seventeen in the Bellevue Hospital necropsies) in which the epiglottis was deformed in association with syphilitic indurative atrophy of the base of the tongue.

The lungs were involved in twelve cases (38 per cent.) in the form of a chronic productive interstitial pneumonia, in four of which bronchiectatic cavities were present. In addition, syphilitic pleural scars were encountered twice.

Ulcerative and cicatricial tracheal lesions were met with four times, and in one of these cases the deformity was of such a nature as to demand tracheotomy.

The nasal septum was perforated in four cases and the hard palate once.

#### THE NERVOUS SYSTEM

Lesions of the nervous system were encountered in 112 of the 314 Bellevue Hospital necropsies, or in 35.6 per cent. They were distributed as follows: chronic productive leptomeningitis 18, 2 of which were gummatous, granular ependymitis 23, chronic productive pachymeningitis 11, encephalomalacia 15, endarteritis obliterans 27, in 7 of which miliary aneurysm was associated, gummas of the brain substance 8, tabes dorsalis 4, paresis 4, gliosis of the cervical cord 2.

#### SYPHILIS OF THE LIVER

The tendency of syphilis is to pursue a course marked by inflammatory changes resulting in over-production of connective tissue. In no organ is the inimical effect more pronounced than in the liver, in which sclerotic changes are frequently traceable to syphilis. In the Bellevue Hospital series, syphilis of the liver occurred 105 times (33.4 per cent.).

In atrophic cirrhosis of the liver the cause most commonly invoked is, of course, alcohol. Of nearly 300 examples of so-called alcoholic cirrhosis encountered at necropsy at Bellevue Hospital in the past ten years, concomitant anatomic changes attributable to syphilis occurred in only a negligible number. Nevertheless, in about 80 per cent. of all recent cases diagnosed clinically as atrophic cirrhosis of the liver, the

Wassermann reaction was positive, and in a number of these cases the diagnosis was confirmed by postmortem examination. This fact, taken in connection with the known tendency of syphilis to produce sclerosis of connective tissue, and the peculiar susceptibility of the liver, would seem to indicate that syphilis is a more powerful factor in the production of atrophic cirrhosis than is generally recognized.

On the other hand, there is a variety of cirrhosis of the liver in which acquired syphilis is conceded as the specific cause, namely, the so-called hepar lobatum. In this form of cirrhosis, the liver is the seat of scars which are often deep and numerous and which are distributed in such an irregular manner as to divide the organ into lobes of variable size, the surface of the lobulated masses retaining, as a rule, the accustomed smoothness of the liver. In a considerable proportion of cases, the production of scars is due to the healing of gummas. In other circumstances the gnarled condition of the organ seems to represent an expression of the syphilitic tendency to cause sclerosis without the intervention of focal granulomas.

#### HEPAR LOBATUM

In 4,880 necropsies and 314 cases of fatal syphilis, there were fifty cases of hepar lobatum (16 per cent.).

Grouped in decades the ages were as follows:

Age	Number of cases	Percentage
20-30	12	24
31-40	13	26
41-50	11	22
51-60	9	18
61-70	1	2
Not given	4	8

Between 20 and 50 years of age there were thirty-six cases (72 per cent.). The lesion, therefore, is one of youth, or of comparative youth.

**Sex and Color:** The lesion occurred thirty-seven times in whites and thirteen times in negroes, thirty-one times in males and nineteen times in females. Considering the admission ratio of white to colored patients in Bellevue Hospital, the figures quoted indicate a relatively strong representation of negroes and, on the same basis, the disease would seem to be rather common among females.

**Associated Syphilitic Lesions:** In twenty-five of the fifty cases of hepar lobatum syphilitic changes were recognizable in the skin, visible mucous membranes, osseous system, etc. Pretibial scarring occurred twelve times, indurative atrophy of the base of the tongue nine times, lesions of the bony system ten times, lymph node adenopathy three times, eye lesions twice, penile scarring once and syphilitic cutaneous ulcers once.

**Liver:** In thirty-five cases (70 per cent.) the liver was coarsely nodular, and, of these, the edge of the organ projected beneath the costal margin in twelve (34 per cent.), twice reaching as low as the level of the umbilicus. In twenty-two cases the average weight of the liver was 1,596 gm., which approximates the normal. In two cases the liver was the seat of amyloid deposits. In other words, the anatomic lesions and the size and position of the liver indicate that the organ invited palpation during life.

**Spleen:** In thirty-two cases the spleen was enlarged. Of this number, the organ was described as "enlarged," "considerably enlarged," or "very large," in fifteen instances. In seventeen cases the extreme weight of the normal spleen, namely, 200 gm., was greatly exceeded, as shown by the following figures: 730, 440, 460, 275, 750, 980, 500, 420, 540, 800, 530, 620, 600, 300, 840, 630 and 1,340 gm. The average weight of the spleen in seventeen cases of syphilitic cirrhosis of the liver was, therefore, 634 gm., or 434 gm. in excess of the extreme normal limit. On the other hand, in seventeen unselected cases of Laennec's, cirrhosis of the liver in nonsyphilitic subjects, the average weight of the spleen exceeded the extreme normal by only 112 gm.

In twenty-one cases the spleen was in the condition of chronic interstitial splenitis, in three instances it was the seat of amyloid deposits, and on eight occasions its consistence was not recorded.

**Icterus:** In seven instances the conjunctivae were icteric, in six cases the conjunctivae and skin of the face were slightly jaundiced, and in one case there was moderate general jaundice. Jaundice was present, therefore, in fourteen cases, or in 28 per cent. of the total number of cases of hepar lobatum.

Ascites: Ascites was present in eleven cases, or 22 per cent.

Varices: Esophageal varices were detected four times. In one case, the anatomic condition of the varices indicated that recent rupture and hemorrhage had ensued. Superficial enlargement of the abdominal veins occurred twice and peritoneal varices once.

From the foregoing facts it is evident that considerable numbers of cases of hepar lobatum present anatomic changes which might be determined during life. In my postmortem experience I have yet to encounter a case of hepar lobatum in which the diagnosis was made, and but once was the condition suspected during life. On the other hand, I know of two cases in New York in which the clinical diagnosis of Banti's disease was followed by surgical removal of the spleen, and in both instances necropsy revealed the gnarled liver of syphilis.

The incidence of hepar lobatum in acquired syphilis is such as to warrant the search for its existence in every patient who comes under observation in the late or comparatively late days of specific infection. The history of syphilis, and the occurrence of a positive Wassermann reaction are, of course, important, but the determination of visible or palpable evidences of syphilis in the skin or visible mucous membranes, the lymph nodes, bony system, etc., or the presence of slight jaundice of the conjunctivae or skin associated with an enlarged, firm spleen, with or without ascites, should direct the attention of the clinician to the liver, especially since the determination of the disease in the living patient is of extreme importance from the standpoint of treatment. There are reasons for believing that the disease sometimes undergoes spontaneous improvement, and that active antisyphilitic treatment might, in certain cases at least, prove beneficial.

Gummas of the Liver: Gummas of the liver may occur singly, but in the great majority of cases they are multiple and lie immediately under the capsule in the form of nodular projections of variable size and consistence, or are found buried in the substance of the organ. The superior surface of the liver is the site of predilection, consequently the diagnosis is sometimes practicable.

In 314 cases of fatal syphilis in the Bellevue Hospital necropsies, gummas were encountered in various

localities in sixty-seven instances. Of this number, the liver was involved thirty-five times, or in 52.2 per cent. of the total number of gummas.

Syphilitic scars in the surface of the liver were found twenty-seven times (8.6 per cent.) and amyloid disease five times.

#### SYPHILITIC AORTITIS, AORTIC VALVULITIS, ANEURYSM

Of the 314 cases of fatal acquired syphilis, there were 175 cases of aortitis (55.7 per cent.), a figure noticeably above that of any other individual lesion. Of the 175 cases, the arch of the aorta was involved 109 times, or in 63 per cent., and in forty-two cases the entire vessel was diseased. Combined lesions were encountered twenty-nine times (16 per cent.). Of these the combination of syphilitic aortitis of the arch and upper thoracic aorta was the most frequent, and occurred fifteen times. The combination of thoracic and abdominal aortitis was present three times, and the arch and lower thoracic aorta, the ascending and lower abdominal aorta, the thoracic and abdominal aortas, and the entire arch and the thoracic aorta shared in the process once each.

Aneurysmal Dilatation and Aneurysm: Aneurysmal dilatation of the aorta occurred thirty-nine times (22.3 per cent.). In thirty-five instances the arch was alone dilated, in three cases the aorta was dilated throughout its entire extent, and in one case the arch and thoracic aorta shared the dilatation.

Genuine aneurysm of the aorta was present forty-five times, or in 25.6 per cent. of the total number of cases of syphilitic aortitis. Of these, the arch was alone involved thirty-four times (75.5 per cent.), the thoracic aorta was concerned six times, the abdominal aorta four times, and in one case saccular aneurysms to the number of eight were scattered throughout the vessel.

The Aortic Valves: The aortic valves were sclerotic in sixty-four instances, or in 36.6 per cent. of the total number of cases of syphilitic aortitis. Of this number, the valves were definitely retracted in twenty-seven subjects, or in 42.2 per cent., and it is reasonably to be assumed that the efficiency of the ring was impaired. This figure is in close agreement with that of Longcope, for example, who, in forty-three cases

of aortic insufficiency with symptoms, found an associated syphilitic aortitis in eighteen, or in 41.8 per cent.

In fifty-one of the 175 cases of syphilitic aortitis (28.9 per cent.), the lesion in the aorta was the sole detectable anatomic manifestation of syphilis. In the remaining 124 cases (71.1 per cent.), syphilitic aortitis was associated with one or more definite syphilitic changes beyond the vascular system. Skin changes occurred 34 times, indurative atrophy of the base of the tongue 28 times, penile scars 10 times, chronic interstitial orchitis 40 times, lymph node enlargement 15 times, iritis once, lesions of the upper respiratory tract twice, changes in the bony system 10 times, and in the nervous system 20 times, hepar lobatum 21 times, syphilitic scars in the liver 17 times, and in the kidneys 9 times, and gummas in various localities 26 times. Thus it is apparent that visible or palpable syphilitic changes outside the vascular system accompany syphilitic aortitis in a considerable percentage of cases.

Syphilitic aortitis frequently is associated with companion lesions in other vessels. One of the most important in this connection is to be found in the coronary arteries, involvement of which was recorded forty-five times, or in 26 per cent. Both coronaries were sclerotic in twenty-seven cases, the anterior was alone involved seven times, and the posterior once. In ten cases, one of the coronary arteries was completely occluded, and of these the anterior and posterior were each involved five times. From this it would appear that the association of coronary sclerosis in syphilitic aortitis is to be invoked as an important, if not the most important, determining factor in the production of the anginal pains by which the disease is so often accompanied.

In a single instance the anterior coronary artery was the seat of a miliary aneurysm.

In twenty of the 175 cases of syphilitic aortitis there were associated changes in the smaller cerebral arteries — syphilitic endarteritis obliterans — and in seven of them miliary aneurysm was present.

#### STOMACH AND INTESTINE

There is a noticeable tendency to regard syphilis of the stomach as the anatomic basis for certain gastric disorders, among them symptoms clinically indistin-

guishable from ulcer. In eight cases reported by Downes and Le Wald, the diagnosis of gastric syphilis was based largely on a positive Wassermann reaction, on Roentgen-ray examination of the stomach with the discovery of deformities interpreted as syphilitic, and on improvement after operation, or under anti-syphilitic treatment. In three of their cases, tissues removed at operation and examined histologically revealed granulomatous changes indicative of syphilis or tuberculosis, but in no instance did the pathologist commit himself to a positive opinion.

In the Bellevue Hospital series, gastric ulcer of indubitable syphilitic origin occurred once only. The patient was a white man, aged 32, who died from profuse hematemesis. Necropsy revealed the coarsely lobulated liver of syphilis, together with multiple gummas of the liver, and of the mesenteric, pancreatic and perigastric lymph nodes, syphilitic aortitis, and extensive ulcerative lesions of the stomach presenting the characteristic histologic features of syphilis—chronic productive inflammatory changes attended by miliary gummas, endarteritis obliterans, and circumvascular plasma and round cell infiltration. Pappenheimer and Woodruff, who studied the lesion, were able to find but twelve other acceptable examples of syphilitic gastric ulcer in the literature. My own experience in the histologic examination of gastric ulcers removed at necropsy and operation has not included a single other example of syphilis, and, unless the diagnosis of gastric syphilis is confirmed by microscopic examination, I should not be inclined to accept it.

In six subjects in the Bellevue Hospital series, syphilitic lesions of the intestine were present. Ulcerative lesions of the cecum occurred once, and ulcerative and stenotic lesions of the colon five times. In one case, the splenic flexure and the descending colon 6 cm. below were ulcerated and stenosed, and in the remaining four cases there were stenotic lesions in the rectum.

In the Bellevue Hospital series, therefore, syphilitic lesions of the stomach and intestines in late acquired syphilis occurred seven times, or in 2.2 per cent.

#### GUMMAS

In the Bellevue Hospital series, gummas occurred sixty-five times (20.7 per cent.). They were dis-

tributed as follows: liver 35 (or in 50.4 per cent. of the total number), spleen 8, brain 8, heart 4, kidney 4, larynx 2, muscles 2, lymph nodes 1, epididymis 1.

#### SUMMARY

1. In 4,880 necropsies, anatomic lesions of syphilis occurred in 314 subjects, or in 6.5 per cent.
2. Lesions of the skin and mucocutaneous junctions occurred in 106 subjects, or in 33.4 per cent. Of this number, atrophic pigmented scars of the skin, particularly that of the pretibial region, were encountered sixty-two times. Rupia occurred seventeen times, penile scars seventeen times, and condylomata lata and other syphilids ten times.
3. Enlargement of the superficial lymph nodes occurred in but 6 per cent. of the cases.
4. Lesions of the osseous system occurred forty-eight times, or in 14.9 per cent. of the cases. Chronic productive inflammatory lesions of the cranial bones were met with in twenty-three cases, and similar lesions of the tibia in sixteen.
5. Chronic interstitial orchitis occurred sixty-seven times, or in 39 per cent. of the total number of male subjects. Both testicles were involved forty times, the left eighteen, and the right nine times. Not a single instance of gumma of the testicle was found.
6. Indurative atrophy of the base of the tongue occurred in 25 per cent. of the Bellevue Hospital cases.
7. Syphilitic changes in the respiratory tract were encountered thirty-five times, or in 10.5 per cent. The larynx was involved twelve times, there were twelve instances of chronic interstitial syphilitic pneumonia, four of which were associated with bronchiectasis, ulcerative and cicatricial changes in the trachea were observed in four cases, one of them demanding tracheotomy during life, the nasal septum was perforated four times, and the hard palate once.
8. Lesions of the nervous system occurred in 112 cases, or in 35.6 per cent.
9. Syphilis of the liver was detected in 105 cases, or in 33.4 per cent. There were fifty cases of hepar lobatum, twelve of which were associated with hepatic gummas; twenty-three instances of solitary or multiple gummas without appreciable sclerotic changes in the

stroma, twenty-seven syphilitic capsular scars, and five cases of simple amyloidosis of syphilitic origin.

10. Syphilitic aortitis occurred 175 times, or in 55.7 per cent. of the total number of syphilitic subjects.

(a) The arch was alone involved in 63 per cent.

(b) Dilatation of the aorta was present in 22.3 per cent.

(c) Aneurysm was encountered in forty-five cases, or in 25.6 per cent., and of these, the arch was involved thirty-four times, or in 75.5 per cent. of the total number.

(d) The aortic valves were sclerotic in sixty-four cases, and were definitely retracted in twenty-seven, or 42.2 per cent.

(e) In 71.1 per cent. of the 175 cases of syphilitic aortitis there were associated syphilitic changes beyond the vascular system, many of them being in the skin and visible mucous membranes.

(f) The coronary arteries were sclerotic in 26 per cent.

11. Lesions of the stomach and intestine occurred seven times, or in 2.2 per cent. There was one instance of genuine syphilitic ulcer of the stomach.

12. Gummas were encountered in sixty-five cases, and of these, the liver was involved in thirty-five, or in 50.4 per cent. of the total number.

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